

IN THE CLAIMS:

44. (Previously presented) A method of operation for a telephone interface control system that helps implement a remote telephone extension over a packet data network, where, said packet data network communicatively couples a remote telephone interface to said telephone interface control system, where, said telephone interface control system comprises:

a) a first telephone interface over which a call made to a remote device that is coupled to said remote telephone interface is received by said telephone interface control system;

b) a control system that communicates to said remote telephone interface over said packet data network through a data network interface and communicates over an interface that:

1) can receive an indication that a ringing voltage or tip-ground signal is appearing at said first telephone interface;

2) can generate an off-hook signal;

said method comprising:

receiving a ringing voltage or tip-ground signal at said first telephone interface;

indicating to said control system at said interface that said ringing voltage or tip-ground signal is appearing at said first telephone interface; and

calling said remote device over said packet data network while maintaining said first telephone interface in an on-hook state, said control system causing said calling in response to said indicating.

45. (Previously presented) The method of claim 44 wherein said first telephone interface is an FXO interface.

46. (Previously presented) The method of claim 44 wherein said control system emulates a device that is tie-lined to said remote telephone interface.

47. (Previously presented) The method of claim 46 wherein said calling is implemented with a Private Line Automatic Ringdown (PLAR) call.

48. (Previously presented) The method of claim 46 wherein said control system also initiates an off-hook signal at said interface in response to said indicating.

49. (Previously presented) The method of claim 44 wherein said control system also initiates an off-hook signal at said interface in response to said indicating.

50. (Previously presented) The method of claim 49 wherein said maintaining said first telephone interface in an on-hook state further comprises blocking said off-hook signal from appearing at said first telephone interface so that said first telephone interface is maintained in said on-hook state.

51. (Previously presented) The method of claim 50 further comprising presenting a state to said interface that appears to said control system as if a calling device that caused said ringing voltage or tip-ground signal to appear at said first telephone interface has responded to said off-hook signal so as to

complete a connection between said remote telephone interface and said calling device.

52. (Previously presented) The method of claim 51 wherein said presenting further comprises blocking said indicating to said control system at said interface.

53. (Previously presented) The method of claim 52 wherein said presenting further comprises providing an artificial loop current to said control system at said interface.

54. (Previously presented) The method of claim 53 wherein, if said ringing voltage or tip-ground signal is removed, said artificial loop current is removed.

55. (Previously presented) The method of claim 54 [wherein]further comprising said control system terminating said call to said remote device in response to said removal of said artificial loop current.

56. (Previously presented) The method of claim 50 further comprising no longer blocking said off-hook signal, if said call to said remote device is answered at said remote telephone interface, so as to propagate said off-hook signal to said first telephone interface.

Claims 57 – 58 (Canceled)

59. (Previously presented) The method of claim 44 wherein said first telephone interface is connected to a PBX.

60. (Previously presented) The method of claim 44 wherein said packet data network further comprises an Internet Protocol (IP) network.

61. (Previously presented) The method of claim 44 wherein said packet data network further comprises a Frame Relay network.

62. (Previously presented) The method of claim 44 wherein said packet data network further comprises a High level Data Link Control (HDLC) network.

63. (Previously presented) The method of claim 44 wherein said packet data network further comprises an Asynchronous Transfer Mode (ATM) network.

64. (Previously presented) A method that implements forwarding on ring-no-answer with a remote telephone extension over a packet data network, said packet data network communicatively coupling a remote telephone interface to a telephone interface control system, wherein said telephone interface control system comprises:

- a) a first telephone interface;
- b) a control system that communicates to said remote telephone interface over said packet data network through a data network interface and communicates over an interface that:
 - 1) can receive an indication that a ringing voltage or tip-ground signal is appearing at said first telephone interface;
 - 2) can generate an off-hook signal;

said method comprising:

directing a ringing voltage or tip-ground signal to said first telephone interface from a source that is external to said telephone interface control system, said directing in response to a calling device's attempt to establish a connection to a remote device that is coupled to said remote telephone interface;

indicating to said control system at said interface that said ringing voltage or tip-ground signal is appearing at said first telephone interface;

calling said remote device over said packet data network while maintaining said first telephone interface in an on-hook state, said control system causing said calling in response to said indicating;

removing said ringing voltage or tip-ground signal at said first telephone interface in response to a decision that said calling device's attempt was not answered by said remote device; and,

forwarding said calling device's attempt to another location in response to said decision.

65. (Previously presented) The method of claim 64 wherein said first telephone interface is an FXO interface.

66. (Previously presented) The method of claim 64 wherein said control system emulates a device that is tie-lined to said remote telephone interface.

67. (Previously presented) The method of claim 66 wherein said calling is implemented with a Private Line Automatic Ringdown (PLAR) call.

68. (Previously presented) The method of claim 66 wherein said control system also initiates an off-hook signal at said interface in response to said indicating.

69. (Previously presented) The method of claim 64 wherein said control system initiates an off-hook signal at said interface as a consequence of said indicating.

70. (Previously presented) The method of claim 69 wherein said maintaining said first telephone interface in an on-hook state further comprises blocking said off-hook signal from appearing at said first telephone interface so that said first telephone interface is maintained in said on-hook state.

71. (Previously presented) The method of claim 70 further comprising presenting a state to said interface that appears to said control system as if said calling device has responded to said off-hook signal so as to complete a connection between said remote telephone interface and said calling device.

72. (Previously presented) The method of claim 71 wherein said presenting further comprises blocking said indicating to said control system at said interface.

73. (Previously presented) The method of claim 72 wherein said presenting further comprises providing an artificial loop current to said control system at said interface.

74. (Previously presented) The method of claim 73 wherein, after said ringing voltage or ground-tip signal is said removed at said first interface, said artificial loop current is removed.

75. (Previously presented) The method of claim 74 wherein said control system terminates said calling in response to said removal of said artificial loop current.

Claims 76-77 (Canceled)

78. (Previously presented) The method of claim 64 wherein said first telephone interface is connected to a PBX.

79. (Previously presented) The method of claim 64 wherein said forwarding further comprises forwarding said calling device's attempt to a voice mail system.

80. (Previously presented) The method of claim 64 wherein said packet data network further comprises an Internet Protocol (IP) network.

81. (Previously presented) The method of claim 64 wherein said packet data network further comprises a Frame Relay network.

82. (Previously presented) The method of claim 64 wherein said packet data network further comprises a High level Data Link Control (HDLC) network.

83. (Previously presented) The method of claim 64 wherein said packet data network further comprises an Asynchronous Transfer Mode (ATM) network.

Claims 84 – 88 (Canceled)

89. (Previously presented) A telephone interface control system that helps implement a remote telephone extension over a packet data network, where, said packet data network communicatively couples a remote telephone interface to said telephone interface control system, said telephone interface control system comprising:

a) a first telephone interface over which a call made to a remote device that is coupled to said remote telephone interface is received by said telephone interface control system;

b) a control system that communicates to said remote telephone interface over said packet data network through a data network interface, said control system having an interface that:

1) can receive an indication that a ringing voltage or tip-ground signal is appearing at said first telephone interface;

2) can generate an off-hook signal;

said control system configured to:

1) call said remote device over said packet data network in response to said indication;

2) generate said off-hook signal in response to said indication; and

c) a control feature unit that controls signaling between said first telephone interface and said interface, said control feature unit coupled between said first telephone interface and said interface, said control feature configured to:

1) provide said indication to said interface;

- 2) block said off-hook signal from reaching said first telephone interface so that said first telephone interface is maintained in an on-hook state;
- 3) in response to said off-hook signal, provide an artificial loop current and block said indication so as to appear to said control system that a calling device that has caused said ringing voltage or tip-ground signal to appear at said first telephone interface has responded to said off-hook signal.

90. (Previously presented) The apparatus of claim 89 wherein said first telephone interface is an FXO interface.

91. (Previously presented) The apparatus of claim 89 wherein said control system is further configured to emulate a device that is tie-lined to said remote telephone interface.

92. (Previously presented) The apparatus of claim 91 wherein said call over said packet data network is implemented with a Private Line Automatic Ringdown (PLAR) call.

93. (Previously presented) The apparatus of claim 89 wherein said feature control unit is further configured to remove said artificial loop current if said ringing voltage or tip-ground signal is removed.

94. (Previously presented) The apparatus of claim 93 wherein said control system is further configured to terminate said call over said packet data network in response to said removal of said artificial loop current.

95. (Previously presented) The apparatus of claim 94 wherein said control feature unit is further configured to no longer block said off-hook signal, if said call over said packet data network to said remote device is answered at said remote telephone interface, so as to propagate said off-hook signal to said first telephone interface.

96. (Previously presented) The apparatus of claim 89 wherein said first telephone interface is connected to a PBX.

97. (Previously presented) The apparatus of claim 89 wherein said packet data network further comprises an Internet Protocol (IP) network.

98. (Previously presented) The apparatus of claim 89 wherein said packet data network further comprises a Frame Relay network.

99. (Previously presented) The apparatus of claim 89 wherein said packet data network further comprises a High level Data Link Control (HDLC) network.

100. (Previously presented) The apparatus of claim 44 wherein said packet data network further comprises an Asynchronous Transfer Mode (ATM) network.

101. (Previously presented) A telephone interface control system that helps implement a remote telephone extension over a packet data network, where, said packet data network communicatively couples a remote telephone

interface to said telephone interface control system, said telephone interface control system comprising:

a) first means for receiving a call made to a remote device that is coupled to said remote telephone interface;

b) second means for communicating to said remote telephone interface over said packet data network through a data network interface, said second means further comprising means for:

1) receiving an indication that a ringing voltage or tip-ground signal is appearing at said first means;

2) generating an off-hook signal;

said second means also for:

1) calling said remote device over said packet data network in response to said indication;

2) generating said off-hook signal in response to said indication;

and

c) third means for controlling signaling between said first means and said additional means, said third means for:

1) providing said indication to said additional means;

2) blocking said off-hook signal so as to prevent said off-hook signal from reaching said first means so that said first means is maintained in an on-hook state;

3) in response to said off-hook signal, providing an artificial loop current and blocking said indication so as to appear to said second means that a calling device that has caused said ringing voltage or tip-ground signal to appear at said first means has responded to said off-hook signal.

102. (Previously presented) The apparatus of claim 101 wherein said first means is an FXO interface.

103. (Previously presented) The apparatus of claim 101 wherein said second means also acts as a means for emulating a device that is tie-lined to said remote telephone interface.

103. (Previously presented) The apparatus of claim 102 wherein said call over said packet data network is implemented with a Private Line Automatic Ringdown (PLAR) call.

104. (Previously presented) The apparatus of claim 101 wherein said third means also acts as a means for removing said artificial loop current if said ringing voltage or tip-ground signal is removed.

105. (Previously presented) The apparatus of claim 104 wherein said second means also acts as a means for terminating said call over said packet data network in response to said removal of said artificial loop current.

106. (Previously presented) The apparatus of claim 105 wherein said third means also acts as a means for no longer blocking said off-hook signal, if said call over said packet data network to said remote device is answered at said remote telephone interface, so as to propagate said off-hook signal to said first means.

107. (Previously presented) The apparatus of claim 101 wherein said first means is connected to a PBX.

108. (Previously presented) The apparatus of claim 101 wherein said packet data network further comprises an Internet Protocol (IP) network.

109. (Previously presented) The apparatus of claim 101 wherein said packet data network further comprises a Frame Relay network.

110. (Previously presented) The apparatus of claim 89 wherein said packet data network further comprises a High level Data Link Control (HDLC) network.

111. (Previously presented) The apparatus of claim 44 wherein said packet data network further comprises an Asynchronous Transfer Mode (ATM) network.